Feasibility Study: Demolition of Cal Poly's "Powerhouse"

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The "Powerhouse" is currently an abandoned building located next to the Construction Innovations Center on the campus of Cal Poly San Luis Obispo. The building was constructed in 1908 and is currently the oldest standing building located on campus. Students at Cal Poly have always been aware of the building, as it takes up a significant portion of campus and is located in an area that receives a lot of foot traffic. Unfortunately, many Cal Poly students and faculty are uninformed as to the building's history since it has been boarded-up and abandoned since 1990. This paper examines the Powerhouse building's history together with an analysis of how feasible it would be to have the building demolished and replaced. Due to the lack of published historical information on the building, the University's Facilities Management Department, was interviewed. Since being added to the National Register of Historic Places in 1993, there have been a few attempts to make use of the building space, but they all failed in different ways. This paper attempts to address the most difficult hurdles that would need to be overcome in order to make-way for a useable campus building.

Key words: Demolition, National Registry, Feasibility, Facilities, Administration

Introduction

The "Powerhouse" was first constructed in 1908 as a steam powered electrical distribution system and was one of the first active electrical distribution systems in the city of San Luis Obispo. The building was designed in the Mission Revival style by the State of California Department of Engineering, under State Engineer at Ellery. The building stopped generating power in the 1940's and then abandoned for the first time in 1955. In 1967, the building found use again as a classroom for the Cal Poly College of Architecture and Environmental Design. This classroom was used by the college until 1990, when it was abandoned for the second and final time. Despite being abandoned, the building was added to the National Register of Historic Places on May 7th, 1993.

After the building had been abandoned and added to the National Register of Historic Places, there has been a negative stigma surrounding the broken-down structure. When first attempting to learn anything about Cal Poly's previous attempts to revive the building space, my questions were met with anguish from both Construction Management staff as well as Cal Poly facilities. The closest attempt made to re-use the building space came in 2005, when Cal Poly Facilities had hired RRM Architects to develop a study of the building, along with a design and estimate with the goal of a complete

renovation of the structural envelope of the building. At the time of this study, RRM had stated that, “Facility Services recognized the age of the building, and it’s placement on the National Register of Historic Places created circumstances which warranted a special level of investigation”. This would later turn out to become a much larger issue than anticipated, as Cal Poly has been unable to make any changes to the building until it is officially removed from the National Registry.

On the old front door of the Powerhouse building is an old sign that reads history of the building. Although the text is now fading and it is slowly being covered in vines, the remaining text reads, “The old Powerhouse was built in 1908, and is the oldest building on the Cal Poly campus. It utilized student labor in its construction, thus embodying “learn by doing”. From 1910 to 1940 it supplied all of the electricity and steam heat for the campus. Most recently, this building was occupied by the School of Architecture and Environmental Design…”

The text faded and then continues with, “… was abandoned in 1990. On May 7th 1993, the old powerhouse was accepted to the National Register of Historic Places”.

Figure 1: Powerhouse Sign

Methodology

The objectives for this Feasibility study were to:

- Research the history and controversy behind Cal Poly’s Powerhouse building.
- The challenges and requirements to having the Powerhouse removed from the National Register of Historic Places.
- Providing a method of demolition, along with the challenges that will come with this method.

- Provide results and reasoning why Demolition is this the best option for the current state of the building.
- Analysis from a building that has been demolished and removed from the National Register of Historic Places.

The methodology of research from this study was primarily through personal interviews. With little information on the Powerhouse online or in any of Cal Poly's databases, interviews had provided most of the data found in this study. Unfortunately, with Cal Poly recently opening up campus after a full year of virtual classes during the COVID-19 pandemic, reaching anyone in the facilities department became one of the biggest difficulties of this project. With the limited amount of scholarly resources to research to compare to this project, I used the demolition report/study of a similar building to compare to issues stemming from demolition of the Powerhouse.

Objectives/Analysis:

Removal from National Register of Historic Places

According to nps.gov, "The National Register of Historic Places is the official list of the Nation's historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966, the National Park Service's National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources".

Once the building had been added to this prestigious list in 1993, it became a great deal more difficult to demolish it or complete any renovations. While researching the steps needed on removing a building from the register, I first found that the national register itself does not state that buildings on the list cannot be demolished or refurbished. As stated in by nps.gov, "Under Federal Law, the listing of a property in the National Register places no restrictions on what a non-federal owner may do with their property up to and including destruction, unless the property is involved in a project that receives Federal assistance, usually funding or licensing/permitting".

The issue arises from receiving approval from the SHPO (State Historic Preservation Office). Due to the Powerhouse being located on a California State University campus, there needs to be an accepted petition followed by approval from a SHPO officer. The building will then need to be approved by both a historic preservation office vote, along with a majority public vote. When discussing these required tasks with some of Cal Poly's administration, I learned that the Cal Poly College of Architecture and Environmental Design had once again attempted to demolish the building space sometime around 2010, but it was an unsuccessful attempt due to their struggles of having the building removed from the National Register. There was even rumored to be a $3 Million budget (funding provided by the CMAC) in order to have the building renovated/replaced, however the Cal Poly Facilities team was unable to have the building removed from the National Register at the time. It seems this problem becomes more and more complex the more we dive into it, and it has proven to be the largest issue in having the building demolished.

Funding for Demolition

The Powerhouse was once a functioning steam-powered electrical distribution center, and likely contains structural elements that have not been renovated nor touched since it's original construction in 1908. After speaking with members from Cal Poly Facilities, the building will most likely need a

specialty consultant or an industrial hygienist in order to complete the demolition. Based off demolition of other old buildings on campus, as well as the findings from RRM's "Power House Study", there will be lead and asbestos throughout the building as well as in the surrounding soils. The study goes even further to explain that "Much of the building materials used in the original construction of the Power House, as well as additions and maintenance, contain hazardous materials. Due to the dilapidated condition of the structure, extreme care must be taken in removing lead, asbestos, mold, and contaminated soil.

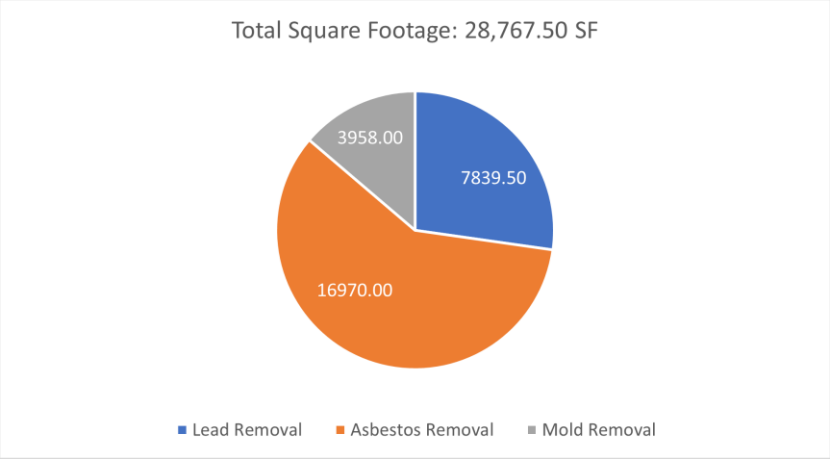

Figure 2: Figure 3: 2005 Estimated SF for Hazardous Material Removal

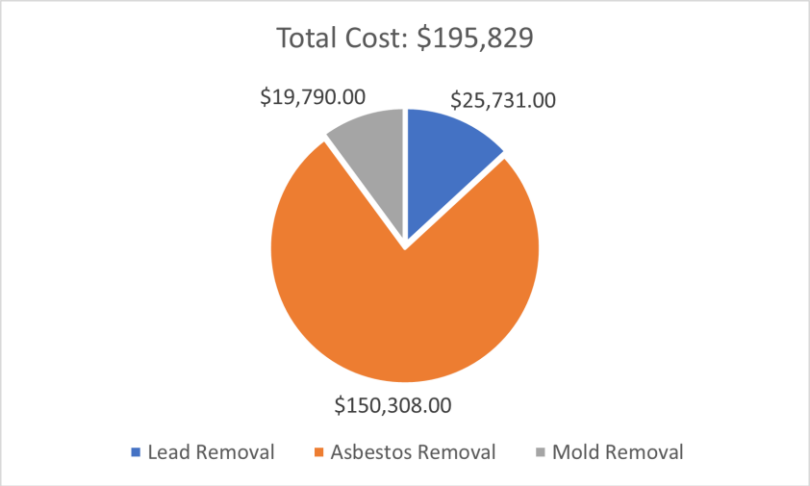

Figure 3: 2005 Estimated costs for Hazardous Material Removal

Figure 3 shown above gives an accurate estimate from 2005 on the cost of removing all hazardous materials from the building, prior to renovation. With the addition of the design, packaging, and trucking costs, the removal and disposal 2005 estimate came out to be around $270,000. Knowing that this estimate was created in 2005, $270,000 back then would be around $382,380 today (Inflation calculated through officialdata.org). These numbers however still do not account for the damages and hazardous materials and wildlife that may have infested the building within the past 16 years.

Numbers that may more accurately reflect how expensive this project is can be found from the demolition on building 52. Recently, Cal Poly has demolished and rebuilt Building 52 on campus, and the building shared many similar issues with the Powerhouse building. Once again, Cal Poly facilities was kind enough to provide me with the information on this project, along with their opinions on it. They first agreed that the demolition of this building would be the most similar project to demolishing the Powerhouse, despite them being different sizes. With the large amount of asbestos contained in the building along with the surrounding soils, the demolition for this project required a specialty consultant (industrial hygienist). In terms of the technique of demolition, it required various detailed steps. First, there were full hazmat suits used and all demolition and containment were performed only with hand tools. The building then had to be taken apart piece by piece and each material would then be packaged and sent to a disposal center. With such a complex technique, the demolition on this project took approximately six months with a contract of over $1,000,000.

I also believe demolition should be preferred over renovation, as there is a vast amount of existing damage throughout the building due to natural, environmental causes. Specifically, there is a considerable amount of damage to the roof in 2 separate areas as shown in Figure 4. These 2 areas of roof collapse were caused by the large amount of rain received in San Luis Obispo in the Winter of 2018/2019. In 2005, there had been an estimated cost $3,003,000 to completely renovate both the structural envelope as well as the interiors. At the time, RRM states that, “The costs referenced are based upon 2005 data and are not firm construction estimates, as no in-depth design or construction documents have been completed. RRM has been very clear in identifying the number of unknowns and challenges in this renovation”. With 15 years of inflation, that cost would be close $4,250,000 with still many unknowns and challenges to overcome. Despite many of the administrations hopes of reviving this old building, the costs seem to far outweigh the benefits in terms of renovation.

Figure 4: Areas of Roof Collapse due to rain

Resistance from Cal Poly Administration

Despite all the issues pertaining to the building's current structure, as well as the issues that arise from restoration, members of Cal Poly's administration still are not inclined to have the building demolished. During my discussion with members of the Cal Poly Facilities office, it seems that this building has caused some controversy amongst the administration. Though there is a portion of the administration that would like to have the building removed and used as something useful for the campus, there is also a portion who want to keep the building due to its historical and sentimental value to Cal Poly. The lack of motivation from the administration to have the building demolished can be a bit frustrating for both the College of Architecture and Environmental Design, as well as the Cal Poly facilities office. In an interview with members of Cal Poly facilities, future plans for the building were being described as "Maintaining the building by not maintaining it". This unfortunate circumstance comes from Cal Poly administration currently wanting to save the building, as there is a large lack of funding that would be needed to just demolish the project. Due to the Administrations stance towards the building, the Powerhouse has been boarded up for the past 15 years and remains untouched ever since.

Demolition Assessment for Similar Buildings

Despite there not being a demolition situation that matches ours exactly, I decided to analyze a similar situation that occurred at the Avon Park Air Force Range in Florida. Within the environmental

assessment demolition report, this Air Force Range has decided to demolish 2 buildings that have been severely water damaged from a hurricane in 2004. Since receiving the water damage, the buildings have both become vacant and unusable. Despite meeting the criteria that would allow for listing in the National Register of Historic Places both buildings, "…are under a programmatic agreement between the Florida State Historic Preservation Office and Avon Park Air Force Range".

Another similarity between this project and Cal Poly's Powerhouse is that the two Air Force range buildings contain both asbestos containing materials and lead based paint. However, these two buildings will be removed by using heavy equipment consisting of a backhoe/nibbler and haul trucks. Looking into the surrounding areas of these buildings, unlike the Powerhouse, there is not nearly as many occupied facilities surrounding them which can allow them to use heavy equipment for demolition (Shown in Figure 5).

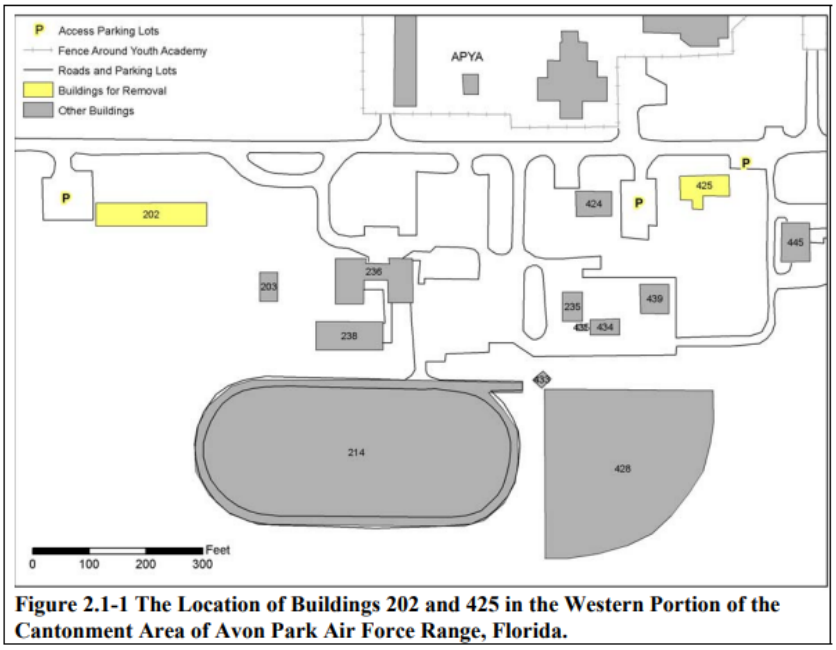

Figure 2.1-1 The Location of Buildings 202 and 425 in the Western Portion of the Cantonment Area of Avon Park Air Force Range, Florida.

Figure 5: Map showing the 2 abandoned buildings

Another interesting finding in this report is their decision not to repair the building, but to demolish it and use the building space for something else. Early in the report they state, "Repairing Buildings 425 and 202 was not considered as an alternative. This conclusion was based on factors to include that APAFR has no demand for office or storage space in or near the locations of the buildings, the buildings have ACMs that would have to be removed during renovation, and the repair costs exceed the replacement costs of the buildings. Air Force Instruction (AFI) 32-1032 Planning and Programming Appropriated Funded Maintenance, Repair, and Construction Projects states that repair cannot commence if replacement is less expensive unless working with buildings listed on the national or a state historic register". The report then states that though the buildings do reach the guidelines pertaining to listing the building in the registry, the buildings are currently not listed. With the cumulative factors of, "a lack of demand, removing ACMs, and high repair costs" this has resulted in not pursuing a repair or renovation alternative. The Powerhouse structure shares all three of these cumulative factors, however it *is* currently listed in the National Registry.

Conclusion/Future Research

Now having spent more than a century on Cal Poly's campus, there is no question on how much historic and sentimental value the Powerhouse provides to our campus. Though it may be difficult for Cal Poly administration and faculty to let go, demolition of this building and using the space for something more useful would be the most beneficial result for the buildings future. The culmination of this study shows how difficult it can be to remove a building from the National Register of Historic Places, and this may help Cal State Universities in their decision before adding more buildings to the list. Hopefully, once Cal Poly finishes adjusting to a post COVID-19 campus, they will be able to complete the necessary requirements through the SHPO to have the building removed from the national registry. Not only is removal from the registry the first step, but it is also the most crucial and difficult.

The cost of renovation versus demolition of the structure is more evidence on why the building should be demolished. Within the 2005 Powerhouse study by RRM Design Group, we can see that there was already a substantial difference in price between renovation and demolition. In 2005, the building's renovation would lead to be the most expensive building on campus per square foot, which is highly illogical knowing that it would most likely be used as another classroom. After the roof collapse in 2018/2019, the cost of renovation has only increased since then as well. The building also contains both ACM (Asbestos Containing Materials) and lead based paint all throughout the structure and in the surrounding soils. In terms of safety, cost, and time, all signs point to having the building demolished and replaced.

For the future, it would be fantastic for either a member of the College of Architecture and Environmental Design or the Cal Poly Facilities office to lead a team to have the building removed from the National Registry. As stated in one of my interviews with a Cal Poly facilities member, "I would love to see the building removed, but the essence preserved, using pieces of the original design to remember it". By using pieces of the building like the sign above the door on the South entrance of the building or the sign on the front door of the West side of the building would be fantastic ways of preserving the buildings history.

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